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The Economics of Cloud Kitchens: Digital Platforms and Urban Business Transformation

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1. Abstract

This study explores the changes in the food industry due to the emergence of cloud kitchens. This research paper will investigate whether cloud kitchens offer a more sustainable, accessible, and profitable business model compared to traditional restaurants in emerging markets. This will be determined using a mix of secondary data and a case study, Bento, an emerging cloud kitchen in Jeddah, Saudi Arabia. Findings indicate that cloud kitchens enhance Profitability and accessibility, but they lack Sustainability. These results are interpreted using Porter's cost leadership strategy, lean startup theory, and corporate social responsibility frameworks. Overall, cloud kitchens are an example of a business model that aligns with the Saudi Vision 2030 goals.

2. Introduction

The fast-food industry has undergone a significant shift over the past decade. Recently, people have started using delivery platforms to order food instead of going to restaurants. This shift was induced by many factors, including technological upgrades and the 2019 COVID pandemic, which forced people to use delivery platforms. Cloud kitchens emerged due to these conditions and thrived. A cloud kitchen is a business model where a restaurant operates exclusively online, without a physical location. By utilizing delivery platforms like Jahez and Uber Eats, cloud kitchens can deliver products to customers, thereby avoiding overhead costs associated with real estate, staffing, and in-person dining.

According to Fortune Business Insights (2023), the cloud kitchen market is expected to grow by 215% from 2023 to 2033, going from a market value of \$65 billion to approximately \$200 billion. This increase can be attributed to the rise in app usage, where 70% of consumers worldwide now use a delivery app at least once a week (Euromonitor), and to the expansion of delivery apps like Uber Eats to new countries, expanding the customer base.

In emerging markets like Saudi Arabia, cloud kitchens align with Vision 2030's objectives of diversifying the economy and enabling younger entrepreneurs. Due to the lower capital requirements for starting a cloud kitchen, this business model presents opportunities for young entrepreneurs in the Saudi market.

This research addresses the following question:

Do cloud kitchens provide a more sustainable, accessible, and profitable business model compared to traditional restaurants in emerging markets?

3. Literature review

Research on cloud kitchens remains relatively new, but several themes still emerge.

a. Cost Efficiency and Scalability

Several studies highlight the cost efficiency of cloud kitchens by showcasing their cost savings. Cloud kitchen Startups require a startup investment of 60-70% of dine-in business models (Restroworks, 2023). Furthermore, rent costs for cloud kitchens also decrease by roughly 55%, and labor costs by 45% due to economies of scale by sharing facilities (RestaurantTimes, 2024). Due to these factors, their average profit margin is around 15-25% compared to the 8-12% profit margin of a dine-in business model.

b. Digital Platform and Consumer Behaviors

According to studies, the outsourcing of delivery logistics using third-party delivery apps like Jahez and Uber Eats has reshaped the food industry. This change resulted in a 300% increase in food-delivery orders in 2020 (McKinsey, 2021).

These delivery apps extend the market reach, while also adding a commission fee of around 20-30% (TechSci, 2024). Furthermore, these delivery apps have caused a shift in consumer behavior, with 70% of urban consumers ordering food online weekly (Euromonitor, 2023).

c. Entrepreneurship and Accessibility

With startup costs accounting for nearly 70% of dine-in business models (Restroworks, 2023), cloud kitchens have emerged as a viable business venture for young entrepreneurs. Aiding this, the launch time for a cloud kitchen business model is 1-2 months compared to 4-6 months for a dine-in business model (Restroworks, 2023). Due to these factors, 42% of new Saudi SMEs are under the age of 35 (SME Authority, 2024).

d. Sustainability and Challenges

Despite financial efficiency, cloud kitchens face CSR issues as the business model induces many environmental challenges. 70% of delivery waste consist of single use packaging (McKinsey, 2021), which increase CO₂ emissions. Furthermore, the delivery vehicle raises CO₂ by around 30% (Euromonitor 2023).

e. Research Gap

This research is limited because most studies focus on India, the United States, and global markets, rather than emerging markets like Saudi Arabia. This study addresses these gaps through a case study, Bento, and a comparative analysis, answering whether a cloud kitchen business model provides a more sustainable, accessible, and profitable option than a dine-in business model.

4. Methodology

a. Research Design

This study uses a comparative qualitative design to analyze the Sustainability, Profitability, and accessibility of cloud kitchens, to compare them to dine-in business models.

b. Data Sources

The study will use secondary data such as industry reports, market analysis, and consulting papers from McKinsey (2021), TechSci (2024), Restroworks (2023), and Euromonitor (2023). A real-world case study, Bento, will also be used to provide first-hand operational insights regarding Saudi Arabia's 2030 entrepreneurship goals.

c. Variables and analysis

The analysis will highlight three variables: Profitability, accessibility, and Sustainability. Profitability will be evaluated based on differences in rent, labor, and margin. Accessibility will be measured using the startup cost, set-up time, and entry barriers. Furthermore, Sustainability will be evaluated through environmental impact and business longevity. The Porter cost leadership theory, lean production, and CSR will then be used to interpret the findings.

d. Limitations

The study's accuracy will be limited because it relies solely on secondary data, rather than primary data, such as surveys. Furthermore, using one case study could result in an inaccurate generalization. Moreover, the data gathered might not be Saudi-specific, which could render it inaccurate. However, this study will provide realistic trends and grounded insights.

e. Data Transparency and Reliability

The data gathered in this study primarily originates from credible market reports and industry reports. Mainly, these sources include (McKinsey, IMARC, TechSci, Restroworks, RestaurantTime). The given figures are estimated industry averages and are not audited data; therefore, the study will highlight trends, not precise calculations. However, the case study Bento does provide real-world data to balance out the secondary data. Ultimately, due to these factors, there will be some data uncertainty, regardless of whether the study will bear fruit for a comparative analysis.

5. Findings and Results

The following results will present the Profitability, accessibility, and Sustainability of a cloud kitchen business model. Each variable will be accessed using numerical data and theoretical frameworks like cost leadership, lean production, and corporate social responsibility(CSR).

a. Profitability

The data in Table 2 shows that cloud kitchens maintain lower costs than a dine-in business model. This is evident in the startup cost, which is approximately 65% of that for dine-in kitchen models (Restroworks, 2023), primarily due to the elimination of the need for dining space and furniture. Furthermore, rent costs decrease by 50-60%(RestaurantTimes, 2024) since there is no need to be located in a prime location, effectively allowing Cloud kitchen owners to pay less for rent. Moreover, the labor costs of a cloud kitchen decrease by 40-50% (Restaurant Times, 2024) because a cloud kitchen business model does not require as much staff as a

dine-in business model; for example, servers, hosts, and cleaning crews are not needed. These variables are supported by the higher profit margin for Cloud kitchens compared to traditional restaurants, as decreasing costs directly increase the profit margin. These trends are confirmed by a qualitative interview with the Bento's team, where the team leader states that cost prices have significantly decreased after adopting a cloud kitchen model to replace their dine-in restaurant.

Table 1

Factor	Cloud kitchen	Dine in	Source
<i>Start up Cost</i>	Decrease of 60-70%	-	Restroworks (2023)
<i>Rent</i>	Decrease of 50-60%	-	RestaurantTimes (2024)
<i>Labor</i>	Decrease of 40-50%	-	RestaurantTimes (2024)
<i>Profit Margin</i>	Increase of 15-25%	Increase of 8-12%	KouzinaFoodTech (2023)

b. Accessibility

The data in Table 2 highlights the broader accessibility that cloud kitchens provide compared to dine-in business models. The higher accessibility primarily benefits younger entrepreneurs by allowing them to enter the market with less capital. This is shown in the difference of startup cost for cloud kitchens and dine-in business models, where cloud kitchens require \$ 40-60k while dine-in requires \$ 120-150k (Restroworks, 2023). Adding to this, set-up time for cloud kitchens is nearly half of a dine-in business model, taking only 1-2 months compared to 4-6 months (Restroworks, 2023). These factors enable younger entrepreneurs to start a business, as evidenced by 42% of cloud kitchen owners being under 35 (Monsha'at, 2024). These claims are further supported by the case study of Bento, where the owner states in an interview that startup costs and startup time were significantly less than those of his other restaurants.

Table 2

Factor	Cloud Kitchen	Dine In	Source
<i>Start up cost</i>	Usd 40-60K	Usd 120-150k	Restroworks (2023),
<i>Set up time</i>	1-2 months	4-6 months	Restroworks (2023)
<i>Youth entrepernourship</i>	42%	-	(Monsha'at, 2024)

c. Sustainability

Furthermore, the data in Table 3 dissect the Sustainability of cloud kitchens. As shown, the market value of cloud kitchens is expected to double in the coming 6 years(MarkNtel Advisors, 2024). Despite this market growth, cloud kitchens present ethical concerns. For one, 80% of orders in cloud kitchens come from third-party apps, which shows a high reliance on digital intermediaries, reducing pricing control (TechSci Research, 2024). Moreover, around 70% of delivery packaging is single-use, an environmental issue that raises CSR concerns(McKinsey & Company, 2021). Food delivery logistics also add up to 30% more carbon dioxide emissions in urban areas, raising ethical concerns about safe labour practices. However, businesses like Bento have overcome these concerns using recyclable packaging and multiplatform operations.

Table 3

Factor	Statistic	Source
<i>Market Growth</i>	USD 173 M-> 335M	MarkNtel Advisors (2024)
<i>Platform independacy</i>	80% of orders	TechSci Research (2024)
<i>Packaging Waste</i>	70% single-use	McKinsey (2021)
<i>CO2 Emissions Form delivery</i>	Contribute up to 30% more CO2	Euromonitor International(2023)
<i>Gig Economy</i>	Ethical CSR concerns	International Labour Organization

6. Discussion

a. Interpretation of Findings.

The data shows that cloud kitchens outperform traditional dine-in restaurants in Profitability and accessibility; however, they come with the downside of ethical and environmental issues. Reduced startup costs, time, and higher Profitability make cloud kitchens a viable option for young entrepreneurs looking to start a business with minimal capital. However, their ethical problems, such as CO2 emissions and packaging waste, can lead to negative CSR.

b. Link to Business Theories

The data reinforces many well-known business theories. An example is the Porter cost leadership theory, which emphasizes increasing profit margins by reducing costs and prices. Cloud kitchens also follow a lean production method, in which they reduce waste to produce more efficiently. Furthermore, cloud kitchens use entrepreneurship and lean startup theories, enabling them to launch and adapt quickly. Lastly, they must utilize CSR to counteract their negative ethical issues.

c. Implications for Industry and Entrepreneurs

These findings serve as a vital stepping stone to broaden the Saudi market, using Bento as an example. By doing this, the Saudi community can help achieve the Saudi 2030 vision by expanding its economy to cloud kitchens and enabling the youth to take part in the entrepreneurial experience.

d. Limitations and Future Research

This study is limited by its reliance on secondary data, the small number of interviews conducted, and its regional focus. Future studies can avoid these limitations by relying on primary data, using comparative case studies, and using sustainability frameworks.

7. Conclusion

This case study explored whether cloud kitchens provide a more sustainable, accessible, and profitable business model compared to traditional restaurants in emerging markets. The case study highlights that profitability and accessibility increase in a cloud kitchen model due to lower costs and faster set-up times. At the same time, Sustainability is mixed due to ethical concerns.

Overall, the results suggest that cloud kitchens provide a more sustainable, accessible business model, but not a fully sustainable one. Businesses must ensure positive CSR initiatives, like eco-friendly packaging, to have a viable future. The stimulus, Bento, exemplifies how a company can align with the Saudi Vision 2030 goals of a broader economy and youth-led projects. Future progress will depend on how cloud kitchens can balance cost reduction and environmental Sustainability.

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